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10/081,815	02/21/2002	Helmut Barfuss	P02,0053	1760

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EXAMINER

PATEL, SHEFALI D

ART UNIT PAPER NUMBER

2621

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/081,815

Applicant(s)

BARFUSS ET AL.

Examiner

Shefali D Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/22/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because line 1 of the abstract states that "In a method an apparatus for..." Perhaps it ought to be "In a method and an apparatus for...". Correction is required. See MPEP § 608.01(b).
2. The disclosure is objected to because of the following informalities: It seems to the examiner that a page in the specification maybe missing. See fourth full paragraph under the section "Description of the Prior Art" line 2 which states "...result can be analyzed". The next page (page 3) begins with "For example, a tumor..." The examiner noticed that there is no relationship between the end of fourth full paragraph and beginning of page 3. Perhaps a page is missing.

Appropriate correction is required.

Claim Objections

3. Claims 2-10 and 14 are objected to because of the following informalities: claim 2 line 1 states "A method as claimed in claim 1 comprising..." This ought to be "A method as claimed in claim 1 further comprising..." or something similar to that effect since claim 2 depend on claim 1 and claim 2 seems to further limit claim 1. Similar corrections to claims 3-10 and 14 are required. See claim 11, for example, where claim 11 further limits claim 1 by stating "...wherein the step of..." Appropriate correction is required.
4. Claim 1 is objected to because of the following informalities: claim 1 line 1 recites "a examination subject" perhaps this ought to be "an examination subject." Appropriate correction is required.
5. The following quotations of 37 CFR § 1.75(a) is the basis of objection:
 - (a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

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6. Claims 8 and 9 are objected to under 37 CFR § 1.75(a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery.

a. Claim 8 recites the limitation "said markers" in lines 1-2. There is an insufficient antecedent basis for this limitation in the claim. The following will be assumed for examination purposes: "attaching [said] markers to said examination subject ..."

b. Claim 9 recites the limitation "said display" in line 2 on page 24. There is an insufficient antecedent basis for this limitation in the claim. The following will be assumed for examination purposes: "a [said] displayed image ..."

7. The following quotations of 37 CFR § 1.75(d)(1) is the basis of objection:

(d)(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description. (See § 1.58(a)).

8. Claim 9 is objected to under 37 CFR § 1.75 as failing to conform to the invention as set forth in the remainder of the specification.

The specification does not describe the elements defined by the last four (4) lines of claim 9, whereby three landmarks in an arbitrary sequence in each data set correspond to two "said" landmarks and a differently spaced landmark. Applicant is invited to point to the section of the specification that provides support for this limitation, or to amend the specification to provide such support (i.e., without adding new matter).

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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10. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

c. Please note: claims 1 and 12, in preamble and in the body of claim, recite “measured result” and “dataset.” Clarify as what really is “measured result” and “dataset.” From reading the application’s specification, the examiner can see that perhaps the measured result is used as a “first image” and dataset as a “second image.”

d. In Figure 1 at step S1, applicants’ discloses “measured result 1” and at step S5, applicants’ discloses “measured result 2.” There is no mention of “measured result 2” in the specification when disclosing step S5 in reference to Figure 1 at paragraph 65.

e. Please be clear and consistent as this maybe a direct translation into English from a foreign document.

f. The dependent claims are rejected for the same reason as claims 1 and 12, and also require similar change(s).

12. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear what is meant by “defining said at least three landmarks in an arbitrary sequence in each of said datasets with reference to said displayed image of said examination subject”. What is meant by “defining ... with reference to”? Does this mean that landmarks in one image are selected, or defined, by referring to another image? What action does this claim element require? In addition, it is not clear what is meant by, “with at least three of said landmarks in each dataset corresponding to two of said landmarks and said landmark that is

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differently spaced from the remainder of said landmarks.” What does this mean? Does this mean that three landmarks are made to correspond with two landmarks? Clarification is required.

Drawings

13. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: *In Figure 1 at step S5, applicants’ discloses “measured result 2.” There is no mention of ‘measured result 2’ in the specification when disclosing step S5 in reference to Figure 1 at paragraph 65. Similar objection apply to Figure 5 step S30.* Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claims 1-5, 7, and 10-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Moshfeghi (US 5,633,951).

With regard to **claim 1** Moshfeghi discloses a method for matching a measured result from an examination subject with at least one dataset containing information from the examination subject (Figure 2), comprising the steps of: arranging a plurality of landmarks on an examination subject in a geometrical arrangement (points P on an object contour Ω as seen in Figure 3); obtaining a measured result from said examination subject, including said landmarks, and optically presenting said measured result as an optically presented measured result (image is being taken of the examination subject, a patient, at volume 1, col. 4 lines 9-19. This is optically displayed on display 20 as seen in Figure 1) acquiring a dataset, including said landmarks, containing information from said examination subject (image is being taken of the examination subject, a patient, at volume 2, col. 4 lines 9-19 including landmarks P as also seen in Figure 3); analyzing the geometrical arrangement of the landmarks in said optically presented measured result and in said dataset using a first algorithm (See parts 2 and 3 of the invention at col. 5 and col. 7. At col. 7 lines 14-49 the contour Ω is formed and the position of the landmarks P on the surface is determined in the shapes of a triangular, polygonal, etc.); and allocating respectively corresponding landmarks in said optically presented measured result and said dataset to form a landmark pair using a second algorithm (allocating corresponding landmarks by surface matching seen in part 4 of the invention at col. 7 line 50).

With regard to **claims 2 and 3** Moshfeghi discloses using said first algorithm to calculate absolute and relative spacings among said landmarks in the respective optically presented measured results and the respective individual datasets (See part 2 and 3 of the invention at col. 5 and col. 7. At col. 7 lines 14-49 the contour Ω is formed and the position of the landmarks P on the surface is determined in the shapes of a triangular, polygonal, etc. See, col. 8 lines 14-40 for positional differences), and using the second algorithm to allocate corresponding landmarks in at least one optically presented measured result and at least one dataset using the absolute spacings calculated with said first algorithm (allocating corresponding landmarks by surface matching seen in part 4 of the invention at col. 7 line 50. See, step

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(a) at col. 7 line 60 where the matching is determined depending on the distance between the landmark points P).

With regard to **claims 4 and 5** Moshfeghi discloses in said second algorithm, permutating the allocation of the landmarks until a predetermined high coincidence is reached (see step d at col. 9 on to col. 10 where the iteration is stop if reached the predetermined number and continue if not). With regards to claim 5, Moshfeghi discloses permutating the allocation of landmarks until 90% by having landmarks permute until 100% as disclosed at step d on col. 9.

With regard to **claim 7** Moshfeghi discloses automatically defining at least one of said landmarks using data underlying the respective optically presented measured results and the respective datasets (landmark point along the spline contour is defined at col. 6 lines 10-18).

With regard to **claim 10** Moshfeghi discloses defining said geometrical arrangement of said landmarks using said first algorithm before defining said landmarks in said at least one dataset (defining the geometrical arrangement of the landmarks as seen in Figures 3-7).

With regard to **claim 11** Moshfeghi discloses analyzing all of said landmarks in landmarks with said first algorithm common with said first algorithm only after all of said landmarks are defined in said at least one optically presented measured result and in said at least one dataset (as disclosed in Figure 4, all of the landmarks correspond to each other and are optically presented on a display).

Claim 12 recites identical features as claim 1 except claim 12 is an apparatus claim. Thus, arguments similar to that presented above for claim 1 is equally applicable to claim 12. Note that Moshfeghi discloses the apparatus as seen in Figure 1 where the landmark definition unit is at element 12, 14, and 16, an analysis unit is at 16 and 18, and an allocation unit and a display is at 18 and 20.

With regard to **claim 13** Moshfeghi discloses definition unit that defines at least one of said landmarks using data underlying said at least one optically presented measured result and said at least one dataset (defining landmarks P at col. 7 lines 15-21).

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With regard to **claim 14** Moshfeghi discloses markers adapted for direct application to said examination subject (col. 4 lines 13-15) and wherein said definition unit automatically identifies at least one of said markers, as at least one of said landmarks, using a pattern recognition algorithm (identifying points on the surface by determining the positional differences, col. 8 lines 15-40).

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moshfeghi (US 5,633,951) in view of Benkelman (US 6,694,064).

With regard to **claim 6** Moshfeghi discloses a method disclosed above in claim 1 and the arguments are not repeated herein, but are incorporated by reference. Moshfeghi does not expressly disclose rejecting false landmarks as recited in claim 6. Benkelman discloses this at col. 11 lines 44-50. Moshfeghi and Benkelman are combinable because they are from the same field of endeavor, i.e., aligning multiple images to one another. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Benkelman with Moshfeghi. The motivation for doing so is to not include the landmarks that did not correspond when allocating and obtaining corresponding landmarks to decrease the error in matching images as suggested by Benkelman at col. 11 lines 44-62. Therefore, it would have been obvious to combine Benkelman with Moshfeghi to obtain the invention as specified in claim 6.

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18. Claims 8 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moshfeghi (US 5,633,951) in view of Schneider (US 6,351,573).

With regard to **claim 8** Moshfeghi discloses a method disclosed above in claim 7 and the arguments are not repeated herein, but are incorporated by reference. Moshfeghi does not expressly disclose physically attaching markers to the subject and automatically defining at least one landmark as recited in claim 8. Schneider discloses physically attaching and defining the marker on a subject at col. 8 lines 1-5. Moshfeghi and Schneider are combinable because they are from the same field of endeavor, i.e., aligning multiple images to one another. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Schneider with Moshfeghi. The motivation for doing so is to have the markers inter-reference the two images as suggested by Schneider at col. 8 lines 5-10. Therefore, it would have been obvious to combine Schneider with Moshfeghi to obtain the invention as specified in claim 8.

With regard to **claim 15** Schneider discloses a computer with a picture screen and an input unit at element 16 in Figure 1, the computer has a screen and an input unit.

With regard to **claim 16** Schneider discloses having a computer with a mouse at processing means 16.

With regard to **claim 17** Schneider discloses a memory, accessible at least by said definition unit, in which said at least one optically presented measured result and said at least one dataset are stored (col. 7 lines 30-38).

With regard to **claims 18-20** Schneider discloses a memory, as disclosed above in claim 17. It would be obvious that the memory stores the landmarks defined in both the measured result and the dataset as Moshfeghi discloses having these landmarks and the datasets.

Conclusion

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19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 5,226,095 – method of detecting the position of an object pattern in an image

US 5,946,425 – automatic alignment of volumetric images containing common subject matter

US 6,466,813 – MR-based volumetric frameless 3-D interactive localization, virtual simulation and dosimetric radiation therapy planning

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shefali D Patel whose telephone number is 703-306-4182. The examiner can normally be reached on M-F 8:00am - 5:00pm (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shefali D Patel
Examiner
Art Unit 2621

February 14, 2005



BRIAN WERNER
PRIMARY EXAMINER